Case Report:
Fracture of a Sound Tooth in a Pilot Under Hypobaric Conditions

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I have no financial relationships to disclose.

I will not discuss off-label use and/or investigational use in my presentation.
Odontocrexis/Tooth Fracture

• Odontocrexis is a Greek word meaning “tooth explosion.”

• First described by Calder and Ramsey within an aeronautical environment in aircrew personnel, due to changes in barometric pressure.

• This phenomenon often occurs in teeth with large defective dental restorations.

• There are no articles of tooth fracture occurring without pathology or dental treatment.

• We describe a tooth fracture, occurring in an apparently sound tooth, in a fighter pilot during flight.
Chief Complaint and Case History

• Dec. 2009, a fighter pilot presented to the Dental Clinic at the French Military Medical-Surgical Hospital at Kaia (International Airport at Kabul) for sensitivity to cold in the right mandibular area.

• The jet pilot flew at a maximum of 12,000 feet (3600 meters) for about 90 minutes.

• During descent (near 3000 feet), he felt that his tooth “inflated” with acute pain (not dull or pulse-like) lasting 1 min. He felt as though the tooth had broken.

• Patient stated he did not have prior disease or treatment of this tooth, which were confirmed by prior radiological examinations.
Oral Examination/Treatment

• Visual examination noted a fracture in tooth #30 (mandibular right molar FDI #46) in the form of a “V” with the peak in the central pit. Dental hard tissues were clean and had no sign of any decay.

• Presence of wear facets on the teeth from premolars to premolars in both arches. Patient stated that he did grind his teeth during his training from 2002 to 2004, but that he no longer did so. The patient’s roommate stated that no grinding noises were heard while the patient slept.

• Vitality Test
  • A cotton pledget was exposed to ice spray and placed on tooth. The patient responded with sharp pain, suggesting the tooth was vital

• Percussion and Temperature
  • No pain; No sensitivity to heat stimulation. Cold sensitivity was related to large quantity of hard tissue lost in the fracture within proximity of dental pulp.

• Treatment
  • Curettage and application of a protective cavity liner and restoration with an amalgam, as per the recommendations of Zadik, Dychter, and others. Flight restriction for 8 hrs.
• We believe this is the first reported case of odontocrexis occurred on a healthy tooth with no obvious predisposing pathological factors under hypobaric conditions.

• One could expect that the fracture would have occurred during the high speed climb. However, it’s counterintuitive that the event occurred during descent, unless related to G-force from pulling out of a dive, which he did not state.

• The dental hard tissue loss cannot be due to the loss of pre-existent dental restoration since:
  • He did not have prior pathology or treatment on this tooth
  • The angle of the peak of the “V” was so acute, that it could not have been created by most dental instruments.
  • The shape of the fracture area did not clinically resemble dental decay or correspond to tooth weakness. The dental hard tissue walls of the fracture site were sound.

• In regards to possible bruxism leading to this fracture, while physical evidence was present, he stopped grinding five years earlier, the radiology was negative for any tooth pathology, and his roommate stated he did not grind his teeth at night.